

cont. may vary independently depending on the particular coupling
AS structure topology used and the performance target.--.

Page 5, line 1, after "helical" insert --geometry--.

Page 6, line 5, after "equivalent to" and before "304"
insert -capacitor--; after "304 and" and before "305" insert -
resistor--.

Page 6, line 6, delete "note" and insert therefore --not--.

(NF) Page 6, line 29, after "indicated" and before "FIG. 3"
insert --by the arrow--.

Page 9, line 32, after "elements" and before "805" insert -
such as capacitor--; after "805 and" and before "806" insert --
resistor--.

IN THE CLAIMS:

Amend the claims as follows:

1. (Once Amended) A device for coupling RF energy from a
transmission line to a plurality of couplers comprising:

at least one transmission line for carrying energy from a
radio frequency (RF) source;

AS a plurality of interconnecting upper plates distributed
above the transmission line whose dimension extends laterally
beyond the width of the transmission line;

a plurality of interconnecting lower plates distributed
below the transmission line whose dimension extends laterally
beyond the width of the transmission line;

a plurality of vias positioned to sequentially connect an end of individual upper plates to individual lower plates so as to provide a helix structure centered around the transmission line;

a plurality of secondary plates embedded into the helix structure which are parallel to the transmission line;

at least one capacitive element electrically connected to one end of said helix structure;

cont. at least one resistive element electrically connected to an opposite end of the helix structure from the at least one capacitive element; and

A6 a ground layer positioned below the plurality of interconnecting lower plates and above the plurality of interconnecting upper plates.

4. (Once Amended) A multi-element directional coupler used with a multi-layer printed circuit board comprising:

a first coupling structure connected to a radio frequency source;

A7 a plurality of second coupling structures positioned above the first coupling structure for coupling radio frequency (RF) energy;

a plurality of third coupling structures positioned below the first coupling structure for coupling RF energy;

a plurality of vias for connecting individual segments of the plurality of second coupling structures with individual segments of the plurality of third coupling structures so as to

provide [form] a helix structure with axis of rotation centered around the first coupling structure;

a plurality of secondary plates embedded into the plurality of second coupling structures;

cont. a plurality of secondary plates embedded into the plurality of third coupling structures;

A7 a ground layer positioned above the plurality of second coupling structures for providing isolation; and

a ground layer positioned below the plurality of third coupling for providing isolation.

11. (Once Amended) A multi-element directional coupler according to claim 4, wherein the plurality of secondary plates embedded into the plurality of third coupling structures are is positioned parallel with the first coupling structure.

12. (Once Amended) A radio frequency (RF) power coupling device comprising:

A8 at least one transmission line for conducting RF energy applied thereto;

a first plurality of upper connecting structures positioned above the at least one [on] transmission line for providing connectivity for coupled RF energy traveling on the at least one transmission line;

a second plurality of lower connecting structures positioned below the at least on transmission line for providing

connectivity for coupled RF energy traveling on the at least one transmission line;

a plurality of vias for connecting individual segments of the first plurality of upper connecting structures with individual segments of the second plurality of lower connecting structures so as to provide [from] a helix geometric structure;

a first ground layer positioned above the plurality of upper connecting structures for isolating the at least one transmission line and the plurality of upper connecting structures; and

a second ground layer positioned below the plurality of lower connecting structures for isolating the at least one transmission line and the plurality of lower connecting structures: and

cont. A8 wherein at least one of via of the plurality of vias is positioned a predetermined distance from the transmission line for increasing coupling between the at least one transmission line and the helix structure;

13. (Once Amended) A radio frequency power coupling device as in claim 12, wherein the at least one transmission line, the first plurality of upper connecting structures and the second plurality of lower connecting structures are planar structures.

14. (Once Amended) A radio frequency power coupling device as in claim 12, wherein the at least one transmission line is a microstrip, the first plurality of upper connecting structures

are air bridges and the second plurality of lower connecting structures are strip line.

15. (Once Amended) A radio frequency power coupling device as in claim 12, wherein the at least one transmission line, the first plurality of upper connecting structures and the second plurality of lower connecting structures are a stripline.

16. (Once Amended) A radio frequency power coupling device as in claim 12, further comprising:

at least one secondary structure embedded into the plurality of upper connecting structures each secondary structure positioned a predetermined distance from the at least one transmission line, for increasing coupling between the at least one transmission line and the helix geometric structure.

cont.
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17. (Once Amended) A radio frequency power coupling device as in claim 12, further comprising:

at least one secondary structure is embedded into the plurality of lower connecting structures, each secondary structure positioned a predetermined distance from the at least one transmission line, for increasing coupling between the at least one transmission line and the helix geometric structure ;

18. (Once Amended) A radio frequency power coupling device as in claim 17, further comprising:

at least one secondary structure is embedded into the plurality of lower connecting structures, each secondary structure positioned a predetermined distance from to the at least one transmission line, for increasing coupling between the at least one transmission line and the helix geometric structure.

23. (Once amended) A radio frequency power coupling device as in claim 21, wherein the plurality of [plurality] connecting structures is positioned on a third substrate.

25. (Once Amended) A method of increasing the coupling coefficient of a directional coupler device which includes at least one transmission line and at least one magnetic field coupling device comprising the steps of:

positioning an upper interconnecting structure in a second plane parallel to and above plane with the transmission line;

positioning a lower interconnecting structure in a third plane parallel to and below plane with the transmission line;

aligning at least one magnetic field coupling structure at a predetermined distance from and parallel to the at least one transmission line;

electrically interconnecting the at least one magnetic field coupling structure with the upper or lower interconnecting structure; and

electrically interconnecting the upper and lower interconnecting structure using at least one via.

28. (Once Amended) A method as in claim 25, wherein the at least one transmission line is a microstrip, the upper interconnecting structures are air bridges and the second plurality of lower interconnecting structures are strip line.

A11 29. (Once Amended) A method as in claim 25, wherein the at least one transmission line, the upper interconnecting structures and the lower interconnecting structures are a stripline.
